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INTRODUCTION TO PSYCHOLOGY

A SYLLABUS



BY
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HARRISONBURG, VA.

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HARRISONBURG, VA.

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STATEMENT TO THE STUDENT

This course unlike a good many courses stresses thinking rather than memorization of facts. This latter should follow logically and is provided for in reviews and by a certain amount of paralleling of the first term's work with that of the second. Problem-solving or answering questions has long been supposed to be a good method of study, but it is infrequently incorporated into textbooks. Therefore, after ten years of trying out various texts, the instructor has devised these questions based on experience and most of them used at some time, hoping the course will be easier, more practicable and more tangible, and better rounded out than otherwise it would be.

Method of Daily Preparation. Ordinarily the method of preparation may well include (1) review of the previous lesson, perhaps writing a brief summary or making an outline, (2) reading the introductory statement of the instructor, and then (3) a reading of the questions. You would then take up the reading or readings and seek to answer the questions or work the exercises. It is an excellent plan to do some reviewing, (recalling or relearning), before the class meets for its recitation.

Assignments Uneven. You will find the assignments uneven as it is not possible to find topics of equal value or difficulty for each lesson, or if they could be so weighted for one person they would not be such for another. Consequently, expect to spend more time on one lesson than on another. The instructor does not expect you to spend all your time on this course, but hopes the time will run about as in other courses. The time suggested in the catalog and elsewhere, namely, two hours of preparation, is intended as a mean or average for the class.

Ability to Answer Questions. This will vary much and you may find questions that prove an absolute stumbling-block, others you are not certain about, and others where you misinterpret the matter and will have to be set right in class. Don't feel that it is your right to come to class unprepared, but do feel that it is the business of the recitation to clear up difficulties.

Readings. As students vary greatly in the ability to read during a given length of time, no absolute requirement in most cases is laid down. No one could read all the references made with each lesson and there is some danger of reading too much as well as of reading too little. The instructor will usually discuss the readings on each topic in advance.

Note-taking. It is probably desirable to take some notes on what you read. Most students take too many notes; some, too few. With these exercises to guide you very likely most of the references can be read with attention only to parts of the chapter or assignment, and the notes might be taken briefly under each exercise. At any rate this method is worth trying and if you do not like it later, and feel that you would like to give it up, talk freely with the instructor.

The right hand page has been left blank because it was thought that it would be more convenient for you in taking notes either in the library or in class. Of course the one page will not always suffice. You can easily unstaple the syllabus and place in your note book. It is well to protect the eyelets with Denison rings.

INTRODUCTION

The syllabus outlined here is the result of ten years experience in teaching psychology and educational psychology in colleges and normal schools. The author has found it usually a rather difficult subject, especially for students just out of high school. He fell into the method early, of assigning questions and gradually has turned from the fact question as the major type to the so-called thought provoking question. For the method, perhaps indebtedness ought to be acknowledged to Professor W. H. Kilpatrick with his classes in philosophy of education (see his recently published syllabus) and to the *Outlines of Economics*, by Marshall, Wright and Field, published by the University of Chicago Press.

Such a plan finds its corollary in the use of questions following each chapter in texts and will in time perhaps be carried out by interspersing these questions in a sort of outline within the body of the text. It is printed on note-paper for the student and therefore can be easily changed from year to year as new researches of especial importance or new ideas about the desirability of the arrangement or the content come to the teacher's mind.

For the content and the point of view, indebtedness is especially acknowledged to Professors Thorndike and Woodworth and to Professor Strong, a pupil of both, whose book, *Introductory Psychology for Teachers*, has been the most hopeful of all experiments in psychologizing psychology. There is a great deal of borrowing without reference because the ideas of these authors who are from time to time referred to, have given us notions of such value that they have become incorporated into our thinking, just as for example, every student and teacher of psychology unwittingly utilizes constantly without recognition, the findings of that renowned pioneer of modern psychology, William James.

This outline was written for the specific use of students just out of high school, and is planned for one quarter, meeting three times a week, the quarter being the first one of the first year of the course. The second quarter is given over to a study of educational psychology very much along the line of Professor Strong's text, stressing individual differences, the learning process and the use of standard achievement and intelligence tests for diagnostic purposes. The third quarter is, in some respects, a continued application of the subject-matter of the first two, as it is given to problems of classroom management and teaching. There are four sections of the class, due to size and nature of work; those electing to teach in the primary grades, the grammar grades, the junior high school, and to teach the special subject of home economics, this being a Smith-Hughes training school. Consequently, the bias given the course with various groups should and will differ considerably.

The syllabus is cast in the printed rather than the mimeographed form because of repeated requests for copies as the result of the fact that at the 1922 session of the Department of Superintendence of the National Education Association, a Committee on Standards and Surveys of the Association of Presidents of State Teachers Colleges announced that it was the prize syllabus of those offered for this Committee's consideration. It is the intention of the author to make revisions from time to time and he is hopeful that his friends in the profession will freely offer suggestions and criticisms.

EXPERIMENT REPORTS: GENERAL DIRECTIONS

Note. It is important to learn to report accurately the results and conclusions drawn from a study of anything experimentally whether it be chemistry, biology or psychology. The following outline is brief and should be followed closely unless the instructor suggests that it is not necessary to do so in the case of a given experiment.

Experiment Reports

1. **Statement of the Problem.** This may be and preferably should be in the form of a question which you hope to answer, altho it will not always be easy or worth while to put it in this form.
 2. **Apparatus and Procedure.** If the experiment is at all complex, it is well to divide your statement concerning each of these matters, say by having different paragraphs. If you vary in any respect from the method laid down by the instructor, note it here. You will ordinarily not be censured for such variation but your conclusions are certain to be different and as a good experimenter you want to be accurate in every detail.
 3. **Results.** The results will include all tabulations, charts, and facts that grow out of your experimentation. Sometimes this will require a separate sheet, for example, of graph paper; this should be placed here and not at the end or beginning of your report.
 4. **Interpretation, Introspections, Applications, Conclusions.** In this part of the report it is important that you discuss freely the results, using your former reading and class discussion where they apply, and that you note any laws, or applications of a practical nature, or any problems that are not answered but are of interest and apparent value. This is the part of the report that requires thought and care ordinarily.
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General Directions

Not always but frequently two people will work together, E the experimenter or one in charge of the experiment and O the observer upon whom the experiment is performed and who observes or introspects. Usually E and O alternate; after the first performance of the experiment they change places and perform it a second time.

Each time before handing in your report make sure of the following items for the sake of uniformity and ease of looking over the papers: (1) that the date and hour and name of the writer-up of the experiment are placed in the upper righthand corner of the first sheet, (2) that the name of the E and O appear in the lefthand corner and (3) that all the sheets of the report be securely fastened together.

BIBLIOGRAPHY

Note. Only the books frequently used are listed here and they are ordinarily referred to with the name of the author only. In case of two texts listed here by the same author, the first letters of the main words of the titles are used in addition to the name of the author.

Angell, Psychology
Averill, Psychology for Normal Schools
Bagley, The Educative Process
Bolton, The Principles of Education
Cameron, Psychology and the School
Colvin, The Learning Process
Colvin and Bagley, Human Behavior
Dewey, How we Think
Dewey, Moral Principles in Education
Freeman, How Children Learn
James, Brief Course in Psychology
Norsworthy and Whitley, Psychology of Childhood
Pillsbury, Essentials of Psychology
Pyle, Science of Human Nature
Strayer and Norsworthy, How to Teach
Strong, Introductory Psychology for Teachers
Thorndike, Elements of Psychology
Thorndike, Original Nature of Man
Thorndike, Principles of Teaching
Titchener, Textbook in Psychology
Woodworth, Psychology

CH. I. INTRODUCTION

Lesson 1. What Psychology is

Our first problem naturally is to find out something about this study, which, because it is new and different from anything you have studied before, may seem difficult at first, but which, because it concerns you and your friends, and your future pupils, ought to prove a most interesting and fascinating study. Do not read any of the references until you read thru the questions. Probably the most interesting reference today is that to Professor Strong's, *Introductory Psychology for Teachers*. If you read that, note how he illustrates various kinds or branches of the subject of psychology from stories, newspaper accounts and similar material such as you are reading every day.

References: Strong, ch. 1; or Pyle, ch. 1; or Pillsbury, ch. 1; or any other good general text in psychology if these are not available. Question 1 below, is adapted from Thorndike, E. P., p. 2.

1. Which of the following terms refer to mental facts? To physical facts? Which may refer to either? How? Gas, tree, sympathy, money, desire, wish, dog, stone, dreams, headache, inventiveness, pound, taste, intelligence, heavy, sour, oxygen, fatigue, load, pleasure, observe, remember, image, idea, brain.
To what kind of facts do the following refer?
Mob, race, fashion, custom, family, government.
2. What is suggested to your mind about the relationship of the three sciences listed below, i. e. how are they dependent upon each other: physiology (and biology), psychology, and sociology? Is psychology likely to utilize, or to be more or less dependent upon the sciences of astronomy, chemistry, physics, mathematics?
3. From a reading of Strong, pp. 5-12, what do you notice regarding the variety of problems of psychology? What are the kinds of psychology you can find in reading this chapter, e. g. animal psychology, adolescent psychology, psychology of advertising, etc.? Can you suggest other branches of the subject?
4. From different texts you will note the tendency of psychologists to define psychology either as the science of consciousness or of behavior. What does each mean? Which of these points of view is likely to be more profitable for education?
5. What advantage if any, do you see in the statement that it is the science or study of mental life, i. e., can you harmonize these two points of view in that way?

Lesson 2. Methods Used in Psychology

In the first lesson you found out something about the study of psychology; therefore, before you begin the new lesson, write a paragraph of perhaps 100 to 150 words at the end of the class-notes of the last lesson, summing up that lesson, briefly and simply, under the question, "What is Psychology?" Just as that lesson dealt largely with the problem of the subject-matter or content of psychology, so this one will deal with the methods used. This is very important because, while a member of this course at least, you are to be a young psychologist, and as far as you are able with so little experience and training, you will want to re-discover many of the things discovered by trained students of the subject and, by application of what they have found, to be able to improve your methods of work and study. One aim of your work might be that suggested by Professor Scashore, "Not psychology, but to psychologize." Do not read or study question 6 below.

References: Consult the early chapters, usually the first or second of several texts in psychology under the heading "methods" to find their point of view concerning the methods of the subject; Pillsbury, Pyle, Angell, Titchener, Cameron, Averill, Woodworth, etc.

1. Make a list or table of the methods discussed by the different authors you read, giving credit to each for that which he mentions, and noting agreement and disagreement among them. What seems to be the fundamental difference between psychology and other natural sciences in the matter of method, e. g. chemistry?
2. Titchener says "the method of psychology is observation." How do you tie up with this the methods of introspection and experiment?
3. To which type of method is the "behavior" psychologist, who is likely to work with animals, biased? The "consciousness" psychologist? Why?
4. Whatever methods are being used, there are certain precautions regarding the tabulation of results and their use that must be borne in mind. What are these?
5. Why is it that two or more witnesses who have seen the same event may without perjury, give very different versions on the witness stand? Does this have anything to do with method in psychology?
6. **Class Experiments illustrative of psychological method.**
 - a. The instructor will display advertisements (not more than five nor less than 3) and students will arrange them in an order of merit. Why do you place them in this order? That is, what different effect does the best one have upon you?
 - b. At a given signal "Go," the instructor will ask you to begin making short vertical marks upon a paper, for a period of one-half minute. How many do you make in comparison with other members of the class? What helping or hindering ideas went thru your mind?
 - c. The instructor will ask 15 or 20 members to stand in a circle so that all are facing clockwise. At a signal "Go" one member will touch the one in front, etc., until the person who began is touched. The instructor will keep the time and the average gives what may be called the simple reaction-time for the average member of the group.
 - d. Which of the above experiments illustrates the method of introspection? Of experiment? Do they form a sort of series as regards methods used?

No.	Name	Age	Sex
1	John Smith	25	M
2	Mary Jones	22	F
3	James Brown	30	M
4	Elizabeth White	28	F
5	Robert Black	35	M
6	Sarah Green	20	F
7	William Hall	40	M
8	Anna King	25	F
9	Thomas Lee	32	M
10	Jane Taylor	27	F
11	Charles Adams	38	M
12	Elizabeth Clark	23	F
13	George Baker	45	M
14	Frances Miller	21	F
15	Henry Wilson	33	M
16	Isabella Moore	26	F
17	John Davis	31	M
18	Margaret Scott	24	F
19	Richard Young	36	M
20	Ann Hill	29	F
21	Samuel King	42	M
22	Rebecca Green	22	F
23	David Brown	34	M
24	Jessie White	20	F
25	Edward Black	39	M
26	Lucy Hall	25	F
27	Frederick Lee	37	M
28	Harriet Taylor	23	F
29	Alfred Adams	41	M
30	Emily Clark	21	F
31	Benjamin Baker	35	M
32	Elizabeth Miller	27	F
33	Charles Wilson	30	M
34	Anna Moore	24	F
35	Thomas Davis	32	M
36	Margaret Scott	26	F
37	Richard Young	38	M
38	Ann Hill	22	F
39	Samuel King	43	M
40	Rebecca Green	23	F
41	David Brown	36	M
42	Jessie White	21	F
43	Edward Black	40	M
44	Lucy Hall	25	F
45	Frederick Lee	37	M
46	Harriet Taylor	23	F
47	Alfred Adams	41	M
48	Emily Clark	21	F
49	Benjamin Baker	35	M
50	Elizabeth Miller	27	F

Lesson 3. The Major Topics or Problems in Psychology

Until very recently, psychologists, as indeed many other people today, thought of the mind as a set of more or less independent functions or faculties, such as memory, reasoning, perception, and so forth. Today we are apt to liken it to a well organized telephone system, with its central, its connecting wires, and its receivers and transmitters. In other words we try to think of it as a unitary machine or organism, now learning, now thinking, now remembering, in rapid succession or indeed perhaps simultaneously. While a flower is no longer a flower when you have taken it to pieces for study in the botany class, and the mind is no longer mind when you analyze it into the functions that make it up, nevertheless we shall have to take up these interrelated and closely interwoven functions separately to come to know something of them in detail. Today we shall make a brief acquaintance with a large number of them in preparation for the more detailed study of the rest of the term.

References: Consult tables of contents or indexes of any one or more of the psychology texts noted in previous lessons, except perhaps Strong. But as usual read the exercises below, first.

1. In the following paragraph is a hypothetical experience which you might have had some time, in which a number of these major psychological functions of the mind are found. The words used to indicate them are in **bold face**, and where they are not used in the text are listed in parentheses following the phrase or clause of description.

Suppose during a vacation, you are going down town and suddenly as you walk along recalling experiences of the day before (**memory**), a puff of smoke and a shrill noise (**sensation**), which you immediately interpret as indications of an incoming train (**perception**), arrest your **attention**. You quicken your step at the **thought** that perhaps some of your friends who are away at school may be returning on this train, and decide (**will**) to go to the depot in the earnest hope (**emotion**) that you may meet them. You arrive in time and your curiosity (**instinct**) is satisfied, but there is no friend. You then turn your steps up the street as you have been accustomed to do many previous times (**habit**) and are soon at your original destination.

After you have thought over these experiences many of which follow one another in more rapid succession than they can be described and have tried to define them, turn to a text which you have used before preferably, and find a psychologist's definition. Couch each in as simple terms as possible and give credit to the author in your notes. Perhaps the following order would be best; instinct, emotion, sensation, perception, attention, memory, thought, will or volition, habit. The following form of definition or description might be used.—
"Instincts are....."

2. Similarly try to break up or analyze some one or more of the following or kindred experiences: (a) sitting in the classroom when someone is reciting or the teacher is lecturing, (b) at the breakfast table, or (c) at the study desk with perhaps your history text open before you, noting which of the mental functions listed in 1 above, are to be found, and what others. Write up your experience, beginning somewhat as follows: "While sitting at my desk at half past eight o'clock....."

Lesson 4. Situation, Bond and Response

Before we turn to the detailed study of these large problems in psychology, it seems important to get a point of view that has recently come into psychology, and that will undoubtedly help you to keep in mind this unitary nature of mental life as we work along with the different mental processes. That point of view is that all mental life or consciousness or behavior, may be thought of as being comprised of situations or stimuli (singular, stimulus), and bonds or connections, and responses or reactions. We shall use the letters S, B and R, to denote these and try today to get a preliminary view of these terms and their meanings. This lesson should be of special profit to you if you apply the idea to what you do in study or recitation or at any time during your waking life or indeed in your dream life, that is that always you are reacting to situations presented and that you are reacting in one way and not another because certain bonds have been inherited or formed.

References: Freeman, ch. 1, or Strong, chs. 2-4 (to be sketched only). Unfortunately, there are few good references on this subject but that may make it all the more interesting if you will follow thru the problems suggested below. Most recent texts treat these topics briefly.

1. If some one should make a thrust at your face, you would wink. Similarly, if when you have your knees crossed, some one should strike the upper knee, the foot would fly up. What is S and what is R in each case? Do you also get a notion of what the B is like?
2. When you are called upon in this class (S) and make answer (R), what do you notice about S compared with S in 1 above? Name in detail in this case all the things that go to make up the S. Is the R similarly complex? Are most S's and R's complex or simple?
3. In the following illustrations, note wherever possible, what, if any, of the mental functions discussed in Lesson 3 are present, e. g. if one unexpectedly comes upon an old friend (perception), one is first struck with surprise (emotion) and then reaches out the hand in greeting (habit):

Situations

Responses

Rumbling noise heard
Pupils sees word "s-c-h-o-o-l"
Teacher calls pupil's name
Person thinks of mail
Person sees approaching auto

Person thinks "thunder"
Pupil thinks "school"
Pupil goes to board
Person goes to postoffice box
Person steps back in fear

4. The connections between S's and R's are called B's. What is the difference between the bonds in 1 and in 3 above, i. e. which are learned and which did not need to be learned? Try now to define the terms S, R, and B.
5. What is learning, and what is teaching, in terms of these three words or concepts? What, in these terms also, is the purpose of the classroom recitation?
6. Now look back to your summary of Lesson 1 and see how you might profitably supplement it or change it to incorporate this new idea of mental life. Can you take a given period of your life, say five minutes of the classroom period, and analyze it into the S's and R's that go to make it up? (See Lesson 5, question 2).

Lesson 5. Review

As far as possible it will be important for you to proceed in this course according to the recognized laws and principles of psychology. Information to be usable must not only be learned but reviewed or re-learned. It is going to be a valuable thing for you at this time to see (1) how quickly and fully you recognize the points which you have taken up and learned in preceding lessons, (2) how difficult or easy these principles or facts now seem to you as compared with the first time you came upon them in your reading or class discussion, and (3) how well you have formed the habit of keeping your readings and other work up-to-date. If you have never tried the habit, it will be very much worth while to make an effort now to substitute for last-minute preparation of your psychology lesson, the practice of studying it immediately after your recitation (or as shortly after as you have time). What has this suggestion to do with the matter of learning as making bonds?

1. Make up an outline-digest of the material covered thus far in the course. It can follow fairly closely, the outline of the preceding lessons and should not have too many main topics. The instructor will be of any help he can be in shaping this up after you come to class. By the term digest, is meant the idea that an outline, to be useful, cannot be a mere skeleton, but should include descriptive phrases and clauses, e. g., if you wanted to include the topic, "Two opposing views of psychology," you would not follow this simply with "(a) consciousness and (b) behavior," but rather with "(a) consciousness: the description of the contents of mind, its different processes, (b) behavior:....."
2. As a supplement especially to lesson 4, and a review (this word means a new view), write to hand in, a list of 20 situations and their appropriate responses, as in question 3, Lesson 4. It would be valuable if you would make a few of these apply to preceding lessons, e. g. "Hear the word situation—Think of psychology class." Or it would be excellent to select experiences out of your daily life, securing as much variety as time allows.

CH. II. PHYSICAL BASIS OF MENTAL LIFE

Lesson 6. Relation of mind and body; nervous system, neurone, synapse

The purpose of this and the next two lessons is to give you a working notion of the physical basis or background of your mental life. It may seem to you that it is really a study of physiology, but it is rather physiological psychology. Probably it could have been omitted or placed differently in the course but the instructor's experience is that it proves helpful to have this background early if it is not made too detailed or technical. Just as one is better able to understand the products of a country if one understands the physical conditions underlying those products, the nature of the soil, the rock formation, the direction and nature of the winds, so you will understand memory, perception, and thought better if you get a few accurate notions about the nervous system and its functioning.

It will be valuable for you to begin at this time outlining your lessons either before or after the recitation or both, and it may be very much worth while to continue making the brief paragraph summaries.

References: While practically all elementary texts in psychology have chapters on the nervous system, it may be best for every one during these next three periods, to make use largely, of Strong, chs. 40, 41, Pillsbury, ch. 2, ch. 3, pp. 46-54, Thorndike, E. P. pp. 120-162, (excellent cuts). If you want a brief statement before you begin the longer discussion, see Cameron, ch. 2, or Averill, ch. 3.

1. Can you imagine a body without a mind or a mind without a body? What is the relationship of the two? What evidence have we that the mind depends upon physical structures?
2. What is that part of the body called which forms the physical basis of mind (consciousness, behavior)? What are the main parts? What may be said to be its main functions? Explain this last in terms of S, R, B, if possible.
3. What are the general physical characteristics of each of the nerve cells, or neurones? Be able to draw at least three different types and label the parts.
4. How are functions of the nerve cells unlike and how like those of other cells? Into what three general classes are the neurones divided according to function, and where is each largely located?
5. What is the nervous current? What are the important facts about it, its rate, its paths, etc.?
6. What is the synapse? Describe and diagram it. Note in this connection, the probable function of each part of the neurone. What is the relation of the synapse to the bond (B)?

Lesson 7. The Three Levels of Action

In the last lesson we saw how the central nervous system determines mental life, how it is composed of simple elements(the nerve cells), and how they join at the synapse, thus making possible the transmission of the nerve impulse. Today we shall study action or behavior, some of it not ordinarily conscious, and some of it representing the most complicated acts that the human organism can perform. Do not expect to be able to answer all of the questions without reading.

References: See lesson 6.

1. If you prick your hand slightly, it will be withdrawn involuntarily thru reflex action, the control being on the lower level and thru the spinal cord. Show how in turn (a) the mid-brain and (b) the cerebrum become involved when (a) the prick is severe enough that you are led to make a more vigorous response bringing into play other parts of the body, and (b) still more severe so that you look at the injured spot, consciously try to remove the offending object, and may even consider further the question of the possibility of poison from it. What are these three levels called and what distinguishes each from the other? Is it probable that within the highest level, there are really several levels?
2. Make an effort to find three or four illustrations of action on each of these three levels.
3. Diagram each level in general terms or with the illustrations of exercise 1 in mind.
4. Be ready to discuss the following statements:
 - a. Responses of the lower level are inherited or unlearned;
 - b. Responses of the second level are probably also unlearned, but may depend in part, upon learning, e. g. co-ordinated responses;
 - c. Responses of the third level have to do with learning and complex movements and include, therefore, the most automatic habits as well as the most elaborate reasoning.

Lesson 8. Cerebral Activity; Review

In preparing for today's study, go back over the main concepts you have been thinking about in the two previous lessons, the nature and function of the central nervous system, the neurone and its structure and functions, the synapse, and the three levels of action. Bring to class any questions about matters that are not clear, as they will prove real stumbling blocks in the future. Today we shall concern ourselves particularly with mental life (behavior, consciousness) of the third level. You will bring to class to hand in, one diagram under exercise 1 and one diagram under exercise 2, and on a separate sheet, an answer to question 4. The instructor will explain and illustrate 2 before you begin your work, that is, in the assignment.

References: See lesson 6.

1. Draw a rough diagram of the exterior of the left hemisphere of the cerebrum, and locate the two great fissures, and the more certainly localized areas as to function, e. g. the visual, the motor, tactile, and auditory. A cross section should also be made or at least studied noting the thalamus and corpus callosum. It will help you to remember these locations if you will run the hand over the side of the skull as you study a diagram. (A model will be brought to class.)
2. Diagram one or more of the following and be able to describe in the large the brain action that takes place:
 - a. Copying a sentence with a pencil
 - b. Sewing a rather difficult stitch by hand
 - c. Speaking
 - d. Reading a sentence
 - e. Playing the piano by note
3. What are the physiological counterparts of S, B, and R? (Strong, p. 228). Do you feel that you understand better, the problems raised in Part I, especially in lesson 3-5?
4. Sit down now and write a paragraph on the topic, "My reactions to psychology," just without giving it any thought, writing rapidly the things you think and feel about the subject. Don't try to be technical and do aim to be frank and sincere.

CH. III. ORIGINAL NATURE: HEREDITY, INSTINCTS, EMOTIONS

Before beginning this new topic, take a couple of minutes to note the "Statement to Students" at the beginning of this syllabus and to raise the questions as to what part, if any, you have been slighting. Has your instructor also apparently neglected to bear any part of it in mind?

Lesson 9. Heredity: Its Laws and Contributions

In this lesson the purpose will be served if you gain a clear notion of the importance of heredity, that stock of original nature with which we humans start in life. The two factors, heredity and environment, "nature and nurture," are responsible for the vast multitude of responses that we make daily. In most cases they are so complicated and the effects of heredity and environment are so intertwined that it is hard to distinguish them. The practice of trying, however, is excellent, as it leads one to appreciate each the more. It might be said in this connection, that there was at one time a considerable controversy as to which was more important, but this is hardly a valuable question, altho you will probably find yourself leaning to one or the other.

References: Decidedly the best available reference will be Norsworthy and Whitley, ch. 1. Other references are: Pyle, ch. 2, Averill, chs. 4-6, while most psychology texts touch upon the problem.

1. Write out to hand in, a list of say half a dozen physical traits in yourself and others, such as brown eyes, red hair, short-fingeredness, unusual height, etc., and in a parallel column, the ancestor or parent to whom this seems to be traceable.
2. Make a similar table to hand in, trying to be rather more careful of your facts, of mental traits, e. g. musical ability, inventiveness, excellent memory, etc.
3. In such common habits as eating, walking, talking, and observing things as you pass along the street, can you trace to some extent at least, the inherited and the acquired responses?
4. The hereditary contributions seem to be from three sources, race, sex and family (or near ancestry). Can you suggest illustrations of each? What is the value to a teacher, of the hypothesis, "Given a white boy of the Hugh Smith family," . . . i. e. can certain conclusions be drawn about the child's probable school achievements?
5. If the father in this case is a well-educated lawyer with a special interest in social welfare in his community, will these acquisitions affect the son's native ability? Why? What is the value of this fact and the knowledge of it to the teacher?
6. It seems to be proved that the line of inheritance is thru the germ plasm which is quite distinct from the body plasm and that the individual's abilities are determined at the time of the fertilization of the ovum. What importance has this fact for the minister, the teacher, the social worker, in fact, any leader in society?
7. What is the difference between blended and alternate inheritance? Cite illustrations. Which do you think is probably more important?
8. Of the two great laws of heredity that of resemblance, and of variation, one forms the basis of general psychology and the other of individual (differential) psychology. Which must this course largely take up? Why is the other very important for the parent and teacher?

Lesson 10. Instincts and Their Place in Education

This lesson will introduce you to the general problems of instincts and their treatment, so that nature may become nurture to the greatest advantage to the individual and the race. As you study, try to keep in mind your own experiences and to review your own education in and out of school, and also to think of the activities of younger children of your acquaintance. This lesson will be continued in the next, but with reference to special instincts and the subject will be again taken up in the next quarter when learning, or educational psychology, is the major problem.

References: It will be well to read one of the first two or three of the following references only, the rest being given to offer opportunity to find the list of instincts which is called for in Lesson 13: Pillsbury, ch. 10; Norsworthy and Whitley, pp. 21-31; Pyle, ch. 4; Angell, ch. 15; James, ch. 25; Thorndike, P. T. ch. 3; Bolton, pp. 140-164; Colvin pp. 33-63.

1. Do humans have less or more instincts than the lower animals? What is the more important difference between them? Illustrate.
2. Explain briefly, the origin or source of instincts according to the biological law of natural selection?
3. If a boy is intentionally injured by another, what does he instinctively do? If he fails to make this response, what may be the cause? Does a soldier instinctively salute his officer?
4. Make a list of the differences between reflexes, instincts and capacities, and find several illustrations of each. Which of these are more educable? Which may be ends as well as means in education?
5. What are the traits or characteristics common to human instincts? What is the significance of each for education?
6. What are the various methods that may be used in handling (a) undesirable and (b) desirable instincts in home and school? What are the relative merits of these methods?
7. List a half dozen instincts which you have exhibited during the last twenty-four hours. Which are more like original nature and which have been most overlaid with habit?
8. Begin a list of instincts which are of more or less importance in education, not including the reflexes and not including highly specialized and individualized capacities, to be handed in with lesson 13.

(While psychologists have recently come to the conclusion that such general terms as curiosity, pugnacity, etc., are really group names for scores or even hundreds of specialized tendencies, it will be easier if we bear this in mind, but follow the general practice of using the older terminology).

Lesson 11. Some Important Instincts

The teacher and the parent, as well as others interested in problems of social leadership, find themselves confronted constantly with the problem of utilizing the tendencies, which we find in children, and this lesson serves the purpose of giving you opportunity to find out some of the methods of utilizing a few of the most important instincts. The question will be taken up again, and you will be given a chance to study some one instinct in detail next quarter. In this lesson, do not neglect to find out something about each instinct in addition to answering the questions asked, so that if you were asked to give a brief description of it you could do so. Furthermore, this seems important at this point because it will set you thinking about the relation of psychology to your chosen work, teaching, and because it will give many suggestions regarding yourself and cues as to what to look for and interest yourself in, in psychologizing. The instructor will probably want to spend two periods with this lesson or to omit some of the exercises.

References: See Lesson 10. Also Angell, ch. 16; Norsworthy and Whitley, chs. 3-5; Averill, chs. 6-18; Colvin, pp. 55-63; Wordsworth, ch. 7.

1. Take some two or more instincts, e. g. fighting, and indicate carefully, the S's and R's of which their appearance is made up.
2. Can you suggest important uses for the following instincts in the school, particularly in the grade of work in which you are interested; fighting, collecting, desire of approval, migratory instinct, leadership, parental instinct, sex instinct?
3. In what sense is imitation not an instinct? Note diversity of activities included under it, that is, of kinds of imitation. Give illustrations of how imitation may be important and valuable and how it may be unfortunate in the second grade, the eighth grade? How does imitation change with age?
4. How can we use the tendency to physical activity? To mental activity? Which is relatively more important in the kindergarten? In the high school? What courses in school may be said to be based largely upon each?
5. Is the curiosity of the 3-year-old child, the 9-year-old child, the 16-year-old child, different in important respects? How? How can the elementary school make wider use of this important instinct?
6. Why and how is rivalry frequently misused in school? What are at least two important changes in the modern school in the use of rivalry (emulation)? Can you cite good illustrations of use of this instinct?
7. Is there a "social" instinct? Is it the instinct of gregariousness or the gang instinct? At what stages of education is this most important and how can it be best utilized? cf. 1st, 5th and 10th grades.
8. Play has been called the most fundamental instinct for education. Justify this statement if you believe it, and show two extreme viewpoints regarding play and the school and the desirable middle road.
9. Speech or language is based upon the instinct of vocalization. How is learning to talk a matter largely of imitations? What are common errors that need to be corrected in elementary instruction and how do you know they are errors?
10. Take up at least one subject of the typical primary, or grammar grade, or high school course, and show what natural tendencies might advantageously be relied upon by the teacher as furnishing motive-power.

Lesson 12. The Emotions, Feelings and Attitudes

In this lesson you will study a kindred topic to that of the last two lessons, namely the emotions. Like the instincts, they are built upon the solid foundation of heredity, but they are capable of much development. Attitudes, moods and the higher emotions are probably very largely a matter of education and training (environment). Some one has said that the feelings (emotions) are the "mainsprings of life." While therefore the psychologists have not been able as yet to make exact studies of them, for when one tries to study a feeling it disappears from consciousness, yet it is important to get acquainted with the data available on this interesting phase of ourselves.

References: Norsworthy and Whitley, ch. 5; Pillsbury, ch. 12; Bolton, ch. 25; Titchener, pp. 471-503.

1. When one is angry, he may or may not strike the object of his anger, but he is certain to feel angry. What seems to be the relation of emotion and instinct? Is emotion hereditary?
2. What is feeling (or affection) according to the psychologist? What is its place in emotion? How might you define emotion?
3. What is meant by calling fear and grief, "primary" emotions and hate and disappointment, higher or compound emotions? These latter may also be spoken of under such heads as esthetic, intellectual, moral, religious, social emotions. Can you illustrate each of these groups? Try similarly to define and illustrate attitudes, moods and "sentiments."
4. Recall some strong emotion which you may have had. How did it affect the clarity and accuracy of your thinking, the accuracy and effectiveness of your action? Would this hold generally? What of attitudes and moods?
5. An emotion is always attended by much physical and organic activity. What are some of these activities in the case of extreme fear or extreme anger? Is this an important fact for the parent and teacher to bear in mind? Why?
6. Apply the methods of handling instincts (Lesson 10, exercise 6), to two emotions, either anger or fear, and either sympathy or reverence, or courage or happiness.
7. Begin a list of emotions, which will be supplemented in the class discussion and will be completed with lesson 13.

Lesson 13. Review of Lessons 1-12

In lesson 5 you saw the advantage of freshening up your information and of checking up on your acquired stock of ideas about psychology. This lesson is given at this time to assist you further in the same matters as there is a rather definite break in the subject matter at this point. In all likelihood the instructor will want to set a written lesson or test over this matter, on account of the peculiar advantage such an exercise has in giving the teacher a chance to note the nature of the responses of the pupils when he tries to give all a fairly uniform situation. Therefore, some of the questions will be like exercises 1-3, where the opportunity of making the situation uniform for all is greater than in such questions as "discuss" or "state." In answering these be entirely self-reliant the first time and then check up on the answers by reference to your notes, your favorite texts, or your room-mate, and make a score of the number of correct answers that you made. Write out and hand in answers to questions 5 and 6 on separate sheets.

1. Psychology is today usually defined either as the study of.....or of..... A somewhat broader statement of its aim is that it is the study of..... Its general method like that of all natural science is....., which, when focused on one's self and one's own mind, is called.....
2. The modern psychologist thinks of all the various mental processes as being reducible to stimuli or.....and to.....or responses. The connections between these are known as..... Learning may therefore be defined as the forming of....., teaching as the provision of those situations which will secure.....responses.
3. The individual both mentally and physically is a result of heredity and..... The former factor is seen clearly in two great groups of mental processes, the..... which usually involve action and the which involve more of the feeling. The best method for the treatment of the undesirable tendencies is..... while the home and school must provide for wise..... of the desirable ones.
4. What help do you find that you are getting from this course in psychology for your own personal life? Can you suggest ways in which it could be made more helpful by the instructor?
5. List the books you have been using rather frequently, in an order to preference, stating either the quality you like about each, or giving some reason for your preference.
6. Complete (a) the list of instincts and (b) the list of emotions which you began in previous lessons. It might be well to limit yourself somewhat, say to twenty-five of the most important instincts and twenty of the most important emotions.

CH. IV. ATTENTION AND INTEREST

Lesson 14. Nature of Attention

We now turn for three lessons to the related problems of attention and interest. You have noticed many times how teachers, parents and others insist upon attention in dealing with children and inferiors. It must be important, therefore. You have also learned by experience, that you learn more easily when attention and interest combine to assist you. In this lesson the general nature of the attention processes is treated and you will notice that we now turn, as the scientist must sooner or later do, to the statement of some of the laws of psychology.

References: Norsworthy and Whitley, ch. 6; Pillsbury, ch. 6; Colvin 251-270; Strayer and Norsworthy, ch. 3; Averill, chs. 34, 35; Angell, pp. 80-113; Woodworth, ch. 11.

1. If you have ever watched a baby of a few months, you will have noticed his giving attention to various features of his environment and you may have noticed an apparent parallel in his general mental development. Is there an instinct of attentiveness? To what sorts of things does a little child seem instinctively to attend? Note the motor accompaniments of its attention. Do these persist with the adult?
2. Familiarize yourself with some discussion of attention so that you can illustrate it with some diagram, and explain that diagram, e. g. the concentric circles. What is then the concentration of attention? Inattention? Dispersed attention?
3. Remembering, therefore, that the psychologist believes the mind is always attentive or that attention is a feature of all conscious acts, what is a good definition of attention, or, better still, a brief description of attention that will take the place of a definition? Is there one essential characteristic of attention?
4. Be able to define the following terms which represent aspects of the attentive process; duration (rhythm) of attention, span or range of attention, division of attention, distraction of attention.

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Lesson 15. Nature of Attention (Continued)

As this lesson is a continuation of lesson 14, see the introductory statement to that lesson. Before writing up the experiments it will be imperative to look up the introductory statement about "Experiment Reports," and it will be equally important at this point to sketch again the "Statement to the Student."

References: See lesson 14.

1. Be careful to perform the following experiments rigidly so that your results will be accurate. This means keeping the directions listed in "Experiment Reports" before you, starting early and recording results and introspections at once. You are to hand in one experiment.
 - a. Rhythm (duration) of attention—Let one member of the pair listen attentively to the sound of a faintly ticking watch and respond to the fact of the loss of the sound of indicating it by the dropping of the pencil held in the hand and holding it upright when the sound is heard. Let the other member record in the listener's notebook a series of dots at as nearly a uniform rate as follows the time of the periods when heard and not heard respectively. Study and interpret the results.
 - b. Span or range of attention—Let E tap with a pencil an object which will give a sound, making ten trials, the number of taps varying in different trials from 3 to 12 but not in regular order, the time interval being the briefest possible, yet which is necessary to distinguish the sounds. Let O estimate the number, not counting them, and let E keep the record. Is it hard to keep from counting? Is this partly a test of memory as well as the span of attention?
 - c. Division of attention—Let E hold a watch with a second hand and let O in five successive trials, perform the two-fold task of counting as rapidly as possible and of writing the Arabic numerals, 1, 2, 3, etc., of the same series as fast as possible. He must not allow his writing to slow down the counting so that he does not keep ahead. Record introspections, e. g., inhibitions, etc. Note what gain, if any, comes with practice and in the results record scores in both ways of counting. What conclusions do you draw from the test, as to one's ability to attend to two things at once? Cf. other experiences.
 - d. Distraction of attention—Select a passage of some fifteen or twenty lines of printed matter and pick out the a's or pick out some combinations of letters, such as er and count the number. Immediately after the task record introspections of your consciousness during the act of counting and indicate irrelevant impressions, memories, thoughts, etc. What conclusions do you draw?
2. State laws regarding each of the terms listed in question 1 of lesson 14, and with which you have experimented in question 1 of this lesson. If you draw upon some author give him credit, but you can as well state them yourself, perhaps. There is probably a general law of attention or law of selection, see questions 2 and 3 of lesson 14. Can you state this? There are undoubtedly a good many other laws regarding attention and you may if you desire, state any of those. A good method would be as follows: Law of repetition—The repetition of any experience tends to increase its clearness up to a certain point.

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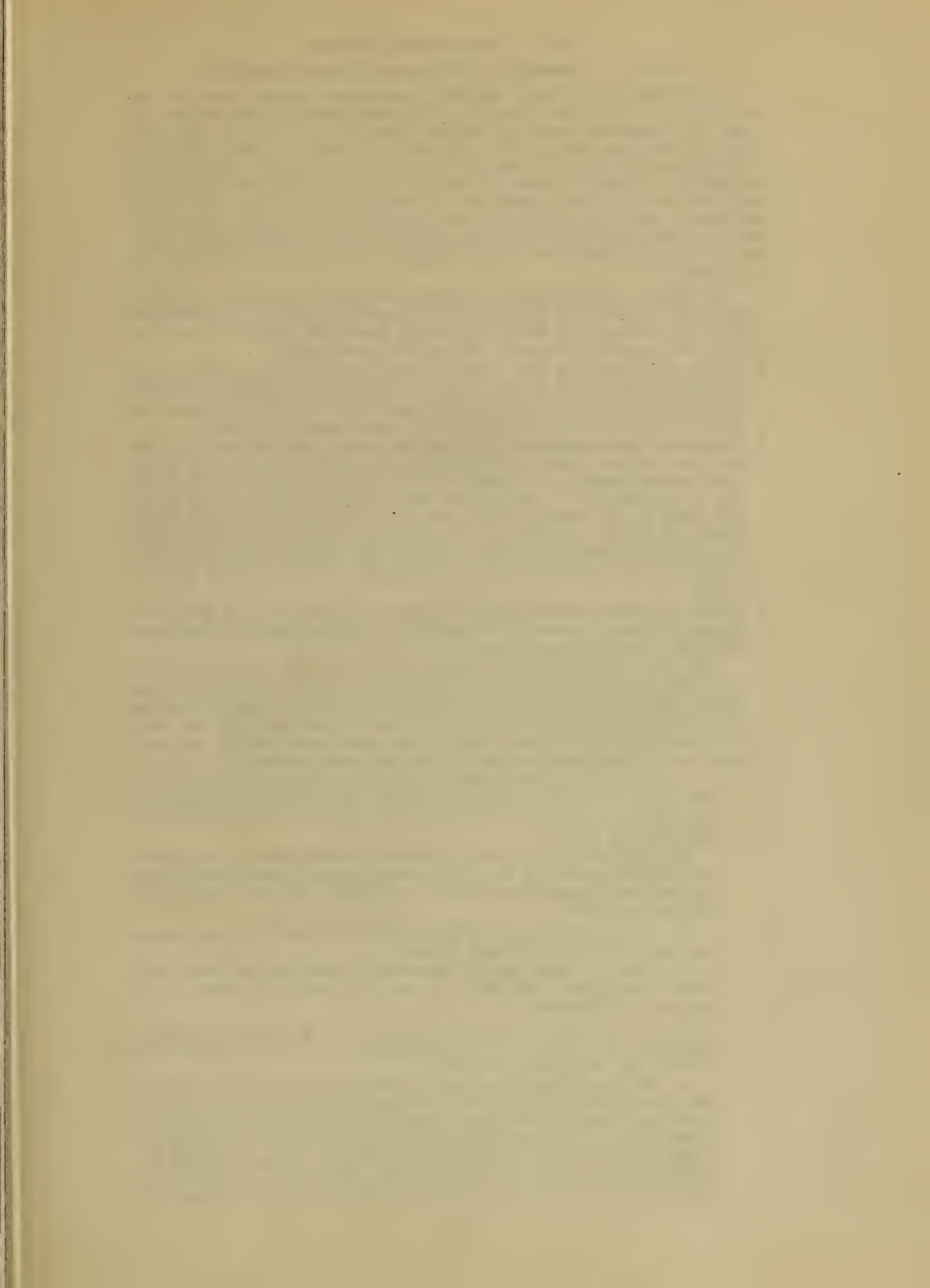
Lesson 16. Attention and Interest; Practical Applications

In the last two lessons, by reading and experiments, you aimed to find out some of the more important characteristics of the mental processes called attention. It would be unsatisfactory to try to go on with this lesson unless you outlined or summarized these lessons.

In this lesson we shall study the practical bearings of attention upon your work as a student and as a prospective teacher. Just as therefore, in the last lesson, you gave attention (note how quite by accident I used the word, but nevertheless used it properly) to the laws of attention, today you will be asked naturally to begin to form practical conclusions in the way of maxims or rules of practice.

References: See lesson 14.

1. Psychologists are fairly well agreed that there are three different types of attention, but they are not agreed upon the names. Find out what you can about these and consider the desirability of the following names: primary (or spontaneous), secondary (or derived), and derived primary (or sustained). Be able to illustrate each from your own recent experiences.
2. Among the qualities of stimuli that attract attention are clearness, intensity, novelty, pleasureableness and expectedness. Which of these are more likely to be connected with each of the three types of attention? Which should a teacher always seek in situations which she presents to the pupil? Which should she use sparingly? Which have to do with the importance of stating the aim of the lesson? Which wear out with excessive use? Which makes a rough drawing often preferable to a finished map? (Adopted from Thorndike, P. T., p. 107).
3. Does interest depend upon knowledge? Do attention and interest always go together? What is interest? When, therefore, is a thing interesting? Can all school matters be made interesting? If not intrinsically interesting, what can be done to secure interest?
4. Interests are in immediate or remote ends. Which are more appealing to little children? Why? What then must the teacher do? Can you cite misuse of this fact in your school experience?
5. Try to analyze your classroom experience, in the elementary school, high school, and normal school, and list the things that have been the occasion of your lagging of interest and attention. Prepare to hand in under the caption or title, "Why my attention lags in class?"
6. State at least three or four very practical maxims for the teacher that grow out of the exercises above.



CH. V. SENSE-PERCEPTION

Lesson 17. Sensation: Illustration of Touch Sensations

Psychologists who have had the consciousness rather than the behavior point of view have usually given much stress to this subject, because they regarded sensations as the elements out of which the other higher processes are made. You will readily see that the field is tempting to the specialist and one is readily led off into problems of physiological psychology. It will be sufficient for you as a prospective teacher if you grasp at this time, the notions of the variety and richness of sensory experience, and its general nature and significance. You may if you like, look into the physiology of the eye and ear and other sense-organs. There are no physical structures more complex and wonderful except the brain itself.

References: Pillsbury, ch. 4; Strong, chs. 35-37; Colvin, ch. 4; Norsworthy and Whitley, ch. 7; Pyle ch. 3; Woodworth, ch. 10. It would be well not to read any of these chapters in detail but only such parts as bear on the questions; one text will probably not suffice.

1. As you sit at the desk now, in what ways is your nervous system being affected (stimulated) by the outside world, or internally, e. g. by the page before you, perhaps by a toothache, by noise or talking, etc. Note the variety of situations and of sense-organs involved.
2. Study the terms sensation and perception and find the difference. What do some writers mean by the terms pure sensation, elementary sensation, simple sensation? Justify the title sense-perception at the heading of this chapter? Arrange the following in a series, noting which you think at one extremity, are more like illustrations of "pure" sensation and at the other, complex perceptions; sight of friend, baby's feelings when burned, sound of tuning-fork, familiar selection on victrola. Give other illustrations of difference but likeness of the two terms.
3. Touch (popularly mis-named "feeling") is a complex of at least four senses, pressure, warmth, cold and pain. Perform and write up carefully the following experiment:

Measure off on the back of the left hand (or right hand if you are naturally left handed), a square approximately a square inch, and divide same into four fairly equal squares. Make a similar plot on paper, preferably four times as large, that is two inches on the side. (Practice each of the four parts of the experiment briefly on some other part of the hand lest you fatigue the area marked off).

1. Take a fairly well sharpened lead pencil or nail and explore the area systematically beginning on one side and running on parallel lines, noting cold spots and marking same in the proper place on the diagram.

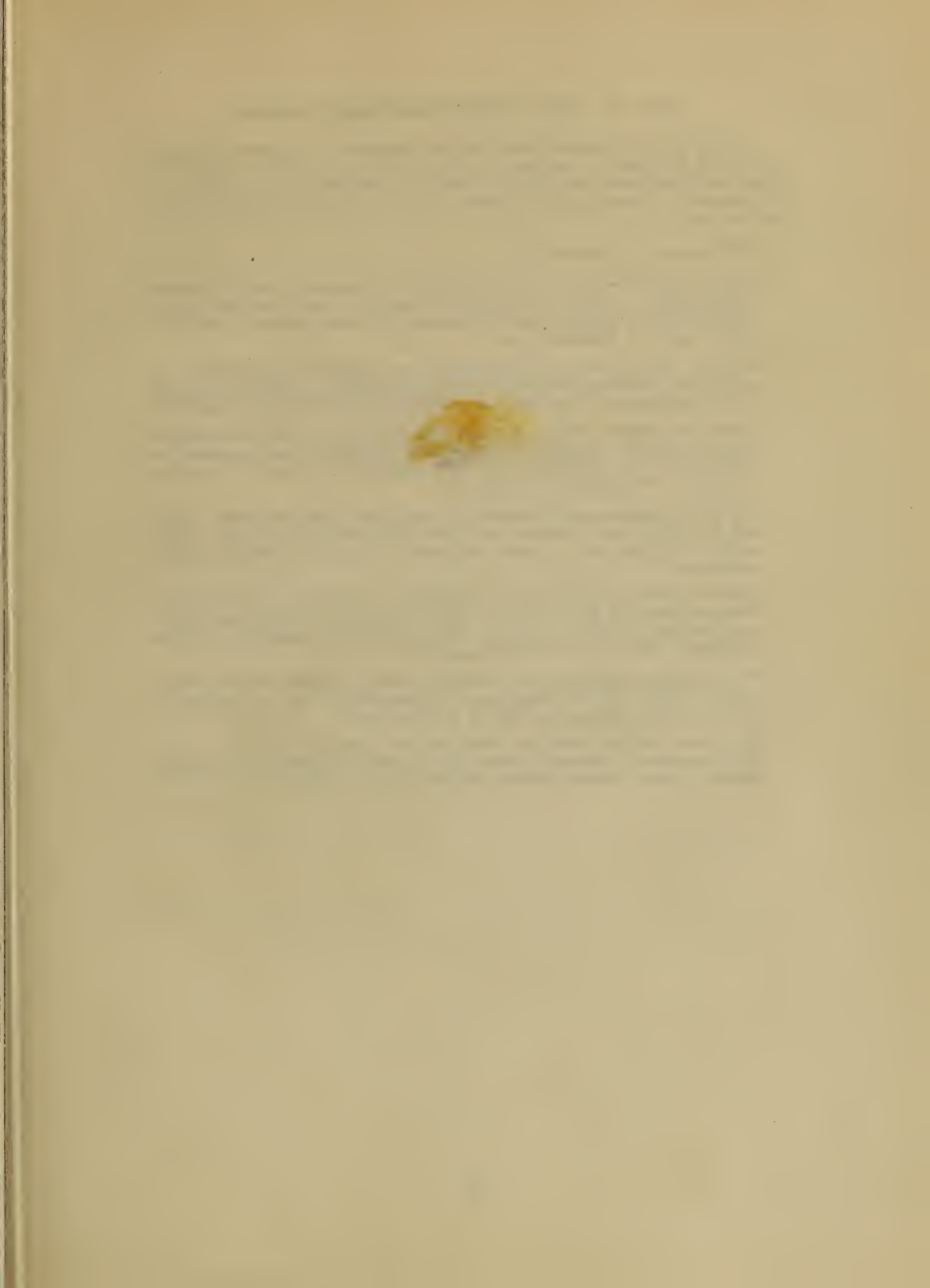
2. Similarly, take a heated pencil or similar object and explore for warmth spots (If no other means avails, place pencil from time to time against lamp bulb). As before, note spots but with a different symbol.

3. Take a stiff hair or bristle or pin and explore for pain spots, and mark with a third kind of mark.

4. Take a sharp pencil, sharpened tooth-pick or very stiff bristle and explore especially at roots of hairs for pressure spots and note on diagram.

. In your write-up, cover any other important details, especially in the nature of introspections, but do not neglect to answer the following questions:

- a. Which of these four kinds of sensations is easiest to locate? Arrange the four in an order of clearness of sensation.
- b. Did you notice any other skin responses that might be taken for sensations? Name them.
- c. What is the value to man of these sensations? Is their value more to civilized man today or savage man in by-gone ages? To the little child or adult, relatively?
- d. What general notions do you draw from this experiment that change your



Lesson 18. Visual, Auditory and Other Sensations

Today we are to study other types of sensations. A part of the class-work will be given to working out the details of the talbe. There are numerous interesting experiments which you will find suggested to you, for example in Strong, Pyle, Pillsbury, and Seashore, and which you may care to try.

References: See lesson 17.

1. Visual sensations are of two kinds, color (chromatic) and brightness (achromatic). Find out the different stimuli of each, the number of qualities and be able to draw and explain the color pyramid (see Pillsbury, Angell or Titchener, etc.).
2. Explain and be able to illustrate and note practical implications for any of the following features of visual sensations: negative and positive after-images, complementary colors, visual contrast, adaptation.
3. Given the situation "some one holds a color before your eyes and asks you to name it," describe the complete details of your response including both the reception of the stimulus and the answer by naming the color. Write this out to hand in.
4. Auditory sensations are likewise of two kinds, tone and noise. Find out the difference in stimuli and variety of qualities of each. What seems to be the best or most acceptable theory, explaining auditory sensations?
5. Find out something about the following sensations and be able to illustrate them or give a simple experiment for locating them: olfactory (smell), gustatory (taste), static, kinesthetic, organic. Do you find other names of sensations suggested?
6. Which of the sensations seem to develop first in the little child? Which later? Which two are most used in education? Are we tending to stress others in education today, e. g. kinesthetic?
7. List sense defects which are likely to be a serious handicap to the child in school? Which of these are curable, remediable, at least by artificial means, which neither remediable or curable?

Lesson 19. Perception

You saw that sensations are primary or elementary experiences, somewhat as are feelings, instincts and reflexes. We seem as adults, seldom, if ever, to have such simple experiences, as they occur in connection with each other or with still other experiences. The most natural and common complex experiences with which sensations are allied or of which they form a part, are perhaps perceptions (percepts). While this following mathematical proportion is not exact and must not be taken too literally, note its meaning—Sensations: perception:: reflex: instinct:: feeling: emotion.

References: Pillsbury, ch. 7; Norsworthy and Whitley, ch. 7; Colvin, ch. 6; Strong, ch. 37; Woodworth, ch. 17.

1. What is apparently sensation and what perception in the following experiences: seeing a horse, hearing an automobile, tasting an orange? How many and what sensations might have gone together or have fused to give you your present percept of apple? What else enters in? Can you judge from these questions how to full-fledged mature percept is probably formed, so that you habitually recognize an object when it is presented to your attention?
2. Errors in perception are commonly known as illusions. Note what is the cause of the illusion in the illustration below:
 - a. Proofreader's illusion—Psychology, if read rapidly in a sentence, would probably be read psychology. Why? Did you so read it?
 - b. Artistotle's illusion—Cross two fingers, placing a marble or pencil between them, so that it touches what otherwise would be opposite sides of the fingers. How many objects do you notice?
 - c. Muller-Lyer illusion—Consult some text (e. g. Pillsbury).
 - d. Try to explain other illusions, e. g. hearing a burglar when alone, seeing a ghost, thinking the wrong train is moving, etc.
3. Reading, one of the most if not the most important school exercise, involves perception very largely (see Pillsbury, pp. 176-180). Watch the eyes of some one reading the lines of this page and record the number of fixations made per line? Pillsbury notes three kinds of reading, by letter, by word and by idea; be able to discuss these and note relative importance. Do illusions enter definitely into the work of teaching, e. g. spelling, reading, etc.?
4. In concluding this study of sense-perception, it would be well to write out an outline or a brief summary of the whole discussion. Add some statement of the importance of perception in education.

CH. VI. IMAGINATION, MEMORY, ASSOCIATION

Lesson 20. Imagery and Imagination

As we turn from sensation and perception to imagination we are turning from a study of present experiences to past (or possible future) experiences. Impressions made upon the mind by the outside world remain in consciousness as images; they affect our behavior markedly even after the experience is long past. The "consciousness" psychologist is inclined to class images with sensations and feelings as making up the elements of all other higher mental processes. We are concerned with getting a clear idea of these processes and their significance for memory and thought in particular. Images are the stuff out of which dreams and hallucinations are made largely. This is a very interesting by-path that some one may want to follow for a little way at least.

References: Strayer and Norsworthy, ch. 6; Colvin and Bagley, ch. 13; James, ch. 19; Colvin, chs. 7, 8; Norsworthy and Whitley, ch. 9; Angell, pp. 196-206, 214-221; Woodworth, ch. 19.

1. Write out to hand in under the title, "My Mental Imagery," the answers to the questions following, in sufficient detail that when cold one can get a good picture of your mental imagery:

A. Visual Imagery

Think of your breakfast or dinner table, as you sat down to it; call up the appearance of the table, the dishes, the food on it, the persons present, etc. Then answer these questions:

1. Are the outlines of the objects distinct and sharp?
2. Are the colors bright and natural?
3. Where does the image seem to be situated? In the head? Before the eyes? At a distance?
4. How does the size of the image compare with the actual size of the scene?

B. Kinds of Imagery

5. Can you call to mind better, the face or voice of a friend?
6. When "violin" is suggested, do you first think of appearance of the instrument or the sounds made when played?
7. Can you call to mind clearly, the following: (a) sight of natural scenery, (b) sound of music, (c) taste of fruit, (d) moving of a boat or hammock or swing, (e) odor of a rose, (f) strain of lifting some heavy object?
8. What kinds of images are suggested to your mind by the words, (a) dog, (b) railroad, (c) write, (d) pull, (e) storm, (f) infinity?

C. Conclusions

Write out a brief summary of the kind of images you seem to have. Are they largely visual or largely of some other kind? Do you seem to be strong in imagery or not?

2. What is an image? cf. to percept? What is imagination?
3. Distinguish between concrete and verbal imagery. What type is the little child more apt to have? The uneducated adult? The scientist? Are some studies likely to call for one type and others the other?
4. Imagery is usually classed as reproductive and productive (or creative). Is the work of the inventor likely to demand one more than the other? Of the teacher? Of the young student? Of the advanced and older student in a subject? What bearing has productive imagination on the world's progress?
5. What are the general traits of the imagination of the little child? What is the import of these for teacher and parent?
6. What definite educational principles have you discovered or thought out in this lesson?

INSTRUCTIONS TO THE JURY

The first duty of the jury is to listen to the evidence presented to them by the parties to the case. They must listen carefully and impartially, without prejudice to either side. They must not allow their own preconceptions or feelings to influence their judgment. They must base their verdict solely on the facts as presented to them by the evidence.

The second duty of the jury is to weigh the evidence. They must consider the credibility of the witnesses, the consistency of their statements, and the probability of the facts as presented. They must also consider the arguments of the parties and the instructions of the court.

The third duty of the jury is to reach a verdict. They must deliberate in private, without the presence of the parties or the court. They must reach a unanimous verdict, unless otherwise directed by the court. They must return their verdict to the court in a written verdict sheet.

The fourth duty of the jury is to follow the instructions of the court. The court will give them instructions on the law that applies to the case. They must follow these instructions carefully and to the letter. They must not add to, subtract from, or modify the instructions in any way.

Lesson 21. Memory and Its Different Phases

Memories or memory processes are very closely allied to imagery and imagination. We probably remember largely in terms of images whether we are aware of it or not, that is, images are the materials out of which memories are made. We might recall and add to a group of members of a proportion which was brought to your attention in a previous lesson, concerning which no claim is made for accuracy but rather for suggestiveness. We would then have—reflex: instinct:: feeling: emotion:: sensation: perception:: image: memory. It is doubtful if many topics are more fruitful or practical to the student than this; therefore, for the sake of your future success as a teacher, in instructing others to use correct habits of memorizing, but also for your own economy of time and your own efficiency, you will do well to study this and the three succeeding chapters with unusual care and thoughtfulness.

References: Woodworth, ch. 14; Pillsbury, ch. 8; Pyle, ch. 7; Norsworthy and Whitley, ch. 8; in each case study parts related to the questions.

1. Would you say that you have a good memory or a poor memory? How does it compare with some one's else, that is do you know some fellow student who seems to have a much better memory? Can you account for this? You will want to study two matters in this and succeeding lessons, (a) the complexity of the memory process (so that your memory may be good in one line and poor in another), and (b) the problem in what ways you can and cannot improve your memory.
2. Reviewing your study of imagination, which type of imagination would you say is practically identical with memory? How, in general, does memory differ from imagination? From sense-perception? Illustrate your answers by concrete experiences as far as possible. Define memory.
3. The psychologist finds four overlapping, but different processes involved in memory; learning (or memorizing), retention, recall, and recognition. Familiarize yourself with the meaning of these terms and find an out-of-school and an in-school experience, each illustrating these four phases. Note also how sometimes, you have the experience of one of the processes failing to function when others do, for example, recognition without recall.
4. Is forgetting natural? Is it entirely disadvantageous? Why? What have psychologists found out about the rate of forgetting? Does this agree with your experience? (This is the first time that you come upon the use of graphing in psychology but you will want to use this from time to time in the future. Try, therefore, to understand what the curve of forgetting means, and to be able to draw and explain it).
5. The instructor will give a test with numbers, letters, nonsense syllables, or unrelated words to find out the individual differences and to measure the memory span of each member of the class during the class period. Find out what is meant by the term, something of its importance at least in diagnosing the probable school achievement of children and also find out something of the differences between children and adults in this regard. Apply this principle of difference of child and adult to memory in general and note that the current popular view about children's memories, as many popular views about psychological matters, is incorrect.

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Lesson 22. Types of or Kinds of Memory

In this lesson we shall pursue further the study of the nature of memory. It would be well first to clear up any problems or difficulties with the preceding lesson as far as possible. The first question is intended to be answered after you have done this. Many interesting problems raised here will be answered largely in the next quarter's work when we shall connect up the general problems of psychology with learning, and when we shall more definitely keep in mind the bearing of psychology upon school work.

References: See lesson 21.

1. Fill in the incomplete statements below, first without the help of any fellow-student, or any other help. Then check your answers and see how far you are correct.

Memories are dependent to a large degree upon.....just asdepend upon sensations. While children appear to learnthan adults, this is due to their..... There are at least four processes in, or phases of, memory, namely,....., and..... Forgetting is as natural a process as remembering, and the curve of forgetting drops..... at first and then.....later on.

2. In the last lesson you learned something about the term memory span and you also found your own span in relation to that of the class and of adults and children in general. This type of memory is known as primary memory. What is the psychologist's explanation of primary memory? Would secondary memory be illustrated by the fact that you might perhaps remember one or more of these combinations today? Is cramming related to primary memory? When is cramming not wholly an unmitigated evil, e. g. with the student, the teacher, the lawyer, the minister?
3. Distinguish between two other kinds of memory, namely, rote and logical (or associative) memory. Which of these is natural to the child and distasteful to the average adult? Why? Which requires forming new bonds and which uses old bonds? Which, therefore, is more economical?
4. The instructor will give a brief test in logical memory and the results can be measured alongside those of the memory span which, while a test of primary memory, is likewise a test of rote memory, is it not? In other words, you will be able to tell something about your status in regard to having a good memory or a poor memory if you rank high in both, or low in both, or medium in both. You may rank high in one and low in the other. What would this mean? Should a teacher rank high preferably, in rote or logical memory? A mail clerk or carrier? A telephone operator? A salesman?
5. The instructor will also give a test to show what the factors are in associative memory. The experiment will prove very interesting and will give you an insight into the way you remember when you do remember, that is, what are the causes of retaining, recalling, and recognizing. (Test adapted from Strong, Lessons 17-18).

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Lesson 23. Association; the Laws (Factors) in Association

The term association was once regarded by psychologists as offering the solution of most problems of psychology, and as being a fundamental principle of mental life very much as is the law of gravitation in the physical world. Today we are inclined to look upon association as being a phase of all consciousness (or behavior) very much as is attention, and of its relationship as being closer to imagination and memory than to other mental processes. The newer view also considers the term as a practical equivalent of the term bond so that today we are really raising the question that is phrased by Professor Strong, as follows: "What are the factors that affect the strength of the bond?" Bonds, connections, and associations, there must be, or situations would not call out the same or similar responses. One can scarcely imagine what sort of mental life if any, we could have under those circumstances.

References: Strong, ch. 18; Colvin, ch. 10; Pillsbury, pp. 136-145; Thorndike, E. P., pp. 238-250; Angell, pp. 206-214; Woodworth, ch. 15.

1. If I suggest to you the word "apple," and you immediately think of or associate with it the word "tree," you no doubt do so because you have associated them together some time in the past. Otherwise, some other response would have been made. Note similarly the response called up by "2 times 2," "the capital of Virginia," "discovery of America," or "289 R" (which latter is the telephone number of the X family). What then, is association? How does the term differ in meaning from the term bond? Do associations exist in rote learning or memory, as well as in logical? Look back to your list of situations and responses in Lesson 5, and note the associations that account for the responses in a number of cases.
2. Returning to the experiment in exercise 5, lesson 22, study carefully each of the responses, noting the factor that caused your answer to be correct or incorrect. Familiarize yourself with Professor Strong's discussion and try to bring to class at least one good illustration of each of these factors out of your recent experience.
3. Which of these factors are of great importance in the work of the school? Which of second-rate importance, and which of very doubtful value? Which are greatly neglected in current school practice? Which should you heed very much more than you have been doing for the improvement of results and economy of time in your study?
4. Write and bring to class not more than a page of this note-book paper (nor less than a half page) of untechnical discussion of the terms, imagination, memory and association, to show that you have a clear notion of these concepts and their relatedness. What may be said to be the general law of association (see indexes of various texts or Thorndike, P. T., pp. 42-3); cf. the notion of apperception?

Lesson 24. Review of Memory and Association; Practical Applications

This lesson, like the last question of the previous lesson, aims to assist you in summing up and clinching the main ideas of the last four lessons. It also aims to help you to fix certain very practical maxims of memorizing. It is probable that the instructor will want to supplement this review with a written lesson at the next period, this to act as a means to a review of the work beginning with lesson 14.

References: Colvin, ch. 11; Strayer and Norsworthy, ch. 5; Pillsbury, pp. 191-213; Freeman, pp. 193-204. See also lessons 20, 21, 23.

1. Find out what you can about the experimental findings of psychologists regarding the effects of sex and of age upon memory. In individual persons, would the law of variation outweigh these factors, e. g. would some boys be likely to excel some girls in.....? At what age are children likely to enjoy verbatim memory work?
2. You have found the question of a "good memory" resolving itself into the matter of (a) natural retentiveness which probably cannot be affected by education any more than the color of one's eyes, and (b) improved methods or habits of memorizing. What have been found to be the secrets of this improvement? (See Strayer and Norsworthy, or Pillsbury).
3. What are the advantages or values in memory systems which you frequently see advertised in the magazines? Of mnemonic or mechanical methods of memorizing? Illustrate. What pitfalls lie in both? And what is after all, the best single system?
4. Going back over the last four lessons, make a list of definite facts that have been rather well established by scientific investigation in the field of memory. This is a field in which much work has been done that really bears upon formal or informal education. Cough your statements briefly and see if they do not stand as laws of memory. (Cf. lesson 15, exercise 2).
5. If you were to be given the task of learning a poem of twenty lines or a prose selection of similar length, what are the most valuable rules and maxims that you could use to make your memorizing effective? You may be able to build these rules in a better order, perhaps around some such cue-words as the following: meaning, recall, repetition, distribution, wholes, association, threshold. Which of these rules would not hold as well of learning history, mathematics, home economics, or psychology? Which do you need to bear in mind to make your work more efficient?

CH. VII. REASONING AND THE PROCESSES INVOLVED IN REASONING

Lesson 25. General Nature of Reasoning

Some one has said, "Animals never reason and man seldom." However, simpler forms of thinking and the exercise of the various mental processes involved in thinking are of frequent occurrence, even if the more elaborate problem-solving is largely left to a few individuals.

You will find this and the succeeding chapter harder than usual unless you check up your readings with your own experiences as you have been asked always to do. There has comparatively little been done in experimenting with the reasoning process as compared with memory and, therefore, introspection is the more important. The best book on the subject and one that you will want some time to have a mastery of, is Dewey's "How We Think;" this book is largely an analytic study rather than experimental, but it has influenced all later writers on psychology and education decidedly.

References: Strayer and Norsworthy, ch. 7; Woodworth, ch. 18; Norsworthy and Whitley, ch. 10; Pillsbury, ch. 9; James, ch. 22; Freeman, ch. 11; Colvin, chs. 20-22. Dewey's "How We Think" is referred to in connection with some of the exercises.

1. What are some of the different uses that people make of the term thinking? Are some of them incorrect? Does it seem to bear a close relation to association? What is the distinct characteristic, if any, in reasoning? When and why do humans reason? Do animals reason?
2. Study the illustrations of thinking (reasoning) in Dewey's H. W. T., ch. 6, tracing out the five steps in his illustrations. Then try to write out to hand in, some fairly recent experience of your own in thinking, noting in the write-up the steps of Dewey. Could one of these steps be omitted in some bits of reasoning and the conclusions be valid? What is meant by reasoning a thing through? Do we often stop short of the end? What is meant by the statement that "it takes time to think?" Is this principle frequently violated by teachers?
3. How can inductive and deductive thinking be distinguished? Which is the more natural with children? Which with an adult who is thinking regarding familiar lines of experience, e. g. his vocation? Do both of these types take place in your illustration above? Cf. grammar, nature study, home economics, algebra, history, this course in psychology? Can you in each case, suggest how a better organization of the course would require more variety of use of these two types? Or a change in emphasis from one to the other?
4. Before you leave this matter, write out a brief summary of this discussion in which is included: thinking, reasoning, the five steps, induction and deduction. Are you yourself, addicted too much to the habit of accepting the conclusions of others as your own, without thinking them out, or without, when possible, arriving at these conclusions yourself?

Lesson 26. Processes Involved in Reasoning; Practical Applications

Just as emotions are inconceivable without feeling and percepts without sensations, so reasoning must be thought of as a complex of many processes including concepts, judgments and inferences. It becomes the whole business of logic, a sister science of psychology, to deal with the results of reasoning, the statements and arguments such as we find in texts and other books, and to establish norms by which to judge the correctness and validity of such arguments. In this lesson we are to see on the other hand, how these various processes dovetail into one another and to draw therefrom a list of valuable suggestions for our own thinking and for our training of others to think. Do not spend too much time on exercises 1 and 2, but save some for 3.

References: See lesson 25.

1. When you think of, have an idea of, say a "horse" or horses in general, without at the time, any sensory experience (percept), this experience or process is known as a concept, or meaning. You will remember that a sensation became a percept when some meaning was attached to the object, so now the concept represents this meaning, come so fully into its own, that it can replace the object itself in our thinking. Does this concept of horse carry with it an image of some one horse or horse-ness in general? Is it necessary for it to do so? When you think the square of "x plus y," do you have an image or do you not? Briefly, what is a concept and the practice or process of conception? Note how this process is a tremendous time-saving device which probably animals have in a very small degree and that our concepts not only grow in our own experience (ripen and develop), but also in the racial experience? (What are good references on the last two points?)
2. Judgment and inference are very closely related processes frequently defined quite differently by different writers, and with conception form the stages in the thought processes as a whole.
 - a. It is probably safe to say that the judgment represents the interpreting of a new experience in terms of the old, a judging. If I come to the conclusion that "psychology is a difficult study," I link two notions (ideas, concepts) together and I interpret my experience in this course as against that in other courses I have taken. What judgments have you made today or recently, that would illustrate the definition and statements above?
 - b. Of inference, we learned something in exercise 3 in lesson 25, where we saw that reasoning which carries us through a situation demanding solution of a problem of any difficulty calls for the organization of knowledge with some care in order that the solution may be correct, that is, based on the evidence. Inferences are probably therefore, extended and elaborate judgments just as these are developed concepts. What is inference? Can you also show the close relation of these three processes by noting how a concept may develop thru judgment and inference?
 - c. Now go back to Dewey, H. W. T., pp. 82-83, and note the concepts, judgments and inferences, using the definitions given above. The instructor will help clear the matter up in class.
3. Do not memorize the following general maxims about thinking in relation to school work but think them over carefully, try to illustrate them, and to apply them to your own work as a student and prospective teacher (cf. Colvin, ch. 22; Strayer and Norsworthy, ch. 7).
 - i. Abstract thought (reasoning) is a capacity or ability that is possessed in varying degrees and in some persons to a very small degree.
 - ii. Reasoning demands data sufficient to solve the problem (if the pupil does not possess the facts, they must be gotten from texts, from the teacher, from observation or other legitimate sources).
 - iii. Reasoning and the rational life require as attitudes, open-mindedness, self-criticism and originality.
 - iv. Training is essential at each step in the thinking process, in defining the problem, in analyzing it into its different elements, in evaluating the tentative solutions, and in verifying the accepted answer.

CH. VIII. WILL AND CHARACTER

Lesson 27. Will, Voluntary Action, Character, Moral Training

There was a time when psychologists had a conception very much like the popular one of today that the will was a separate faculty of the mind which acted as a sort of commanding general of the other faculties or processes. Today we conceive willing or volition as being a counterpart of attention and characterizing our mental life when action follows along the lines of our choices, ideas, ideals and intentions. Our character or moral life is a complex of these ideals and habits that we more or less consciously develop.

References: Pillsbury, pp. 284-9, 303-313; Strayer and Norsworthy, ch. 11; Norsworthy and Whitley, ch. 13; Angell, ch. 22; Averill, ch. 39; Thorndike, E. P., pp. 276-284, 293-6; Dewey, M. P. E.; Woodworth, ch. 20.

1. Some of our acts are planned more or less and others not. What is the actual difference? Has this anything to do with will? Look up the hypothetical experience in Lesson 3 and note the place of willing there. What willed or voluntary action has characterized your behavior today? What do you understand by the psychologist's statement that the will is "the whole mind active?" (Angell, p. 425). Try to state as simply as possible what you regard as the best definition of the term will or volition.
2. Note the meaning of the following terms: desire, choice, wish, decision, conflict, intention, determination, effort. Can you suggest other terms that have to do with willing? Could you arrange these in a series according to degree? Degree of what?
3. It has been stated that "What hold attention determines action" (James, p. 448). Illustrate this. Does this hold of the inattentive child in school? Does emotion enter in to determine will or choice? Does habit? Try to take some experience where you have made an important decision and note the presence of these three factors and others that may be present? Is will more characterized by suppressing or by expressing one's self? Does your answer agree with the popular notion?
4. What is meant by character? In how far is it a question of habits and ideals? What does it mean to have an impulsive will? an obstructed will? a healthy will? i. e. while these phrases are now unacceptable, what is the idea behind each and how does it connect with character?
5. What is will training? (see Angell and Pillsbury). Which is more likely to further character training or the development of the will, (a) moral instruction in what constitutes good citizenship or (b) participation in student government? Why? What is the weakness of moral instruction that is, teaching precepts, or "preaching" in school? Would you rule it out? Why is the teacher's example followed and her precepts ignored?
6. Bearing in mind that the modern view is that the little child when he comes to school is non-moral, what suggestions have you to make to show that Dewey is right in saying that there are three sources of moral education or development in the school, the studies (curriculum), the methods used by the teacher, and the school life itself? What are three or four of the most important rules or maxims for the teacher to hold in mind as summing up the practical aspects of will training or moral education?

CH. IX. GENERAL PROBLEMS: RELATEDNESS OF FUNCTIONS, SELF, MENTAL DEVELOPMENT

Lesson 28. Interrelations of Mental Functions: Personality, Self

You will recall that at the beginning of the course you were told that there was an older and false view of mind, namely that it was composed of a few rigid and separate faculties. On the other hand we now conceive it to be in reality a unit, despite the millions of responses that we perhaps daily make, like a great machine in respect to behavior but frequently and usually conscious of its behavior. While therefore we continue to use much the same terminology as the older view, e. g., memory, emotions, and so forth, we do this to help in analyzing this complex mechanism and to indicate how at one time it focuses in one way and at another time in another way. Oftentimes the labels do not fit well and could be shifted about without much difficulty. Reasoning is like will (involving deliberation), like memory (depending upon recall), like imagination (using images ordinarily), like association of ideas (and almost identical in its simpler forms), and is indeed based similarly upon heredity or natural tendencies. Today we want to think a little while about this general relationship of mental functions or processes and of its bearing upon two interesting problems: (1) the transfer of training from one function to another (see exercise 2), and (2) the meaning of the terms self and personality (exercise 3).

References: Pillsbury, ch. 15; Colvin, pp. 221-217, 241-6; Strayer and Norsworthy, ch. 12; Woodworth, ch. 21.

1. Show, as with reasoning above, how perception connects up with most of the various processes or functions discussed this term. Does this interrelation seem to hold of attitudes and emotions? Pillsbury maintains that there are three general functions of mind, which you have noted in connection with your study of situations, bonds and responses: receiving impressions, retaining impressions, and selecting among these. Are these three in evidence when I perceive a falling star, decide to walk instead of ride, remember the face of a friend in a crowd, etc.? Can you make other analogies than the one in the introduction which suggest the unitary nature of mind? Does this idea of interrelationship really clear up matters for you compared with your notions before studying psychology? Why is it important for the teacher?
2. If functions are so definitely and closely interrelated, when and why, if at all, does training carry over from one to another, e. g., memorizing poetry and prose, being accurate in arithmetic and writing and keeping accounts and in one's statements about other people? Be careful to get the correct view of this matter if you cannot answer the above questions with certainty. Can general intelligence be trained by training one function? Can it be trained at all? Suggest a half dozen very practical rules for the teacher to bear in mind regarding transfer of training (see Colvin).
3. Another problem which arises naturally is that of the nature of personality or self. Just as reasoning is the basis of the study of logic so the study of the self and the not-self is of philosophy. We are concerned only with getting a general and practical working notion of these. Try to describe some one's personality so that another will recognize the person. Do you find yourself using the terms that you have grown familiar with in this course, or other terms? What is personality? How does the idea differ from that of self? Do you have a concept of self (your self) very much as you have of tree or chair? Is it the result of "thinking together" your various experiences? (If you care to read about the self, see Pillsbury, ch. 16; Angell, ch. 23; James, ch. 12).

Lesson 29. Mental Development: Different Stages of

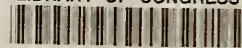
Although there has not seemed opportunity or time to stress it, you have noticed from time to time references to the fact that mental development is a process that begins largely with birth and is never ended until death or at least until senility comes on. A new-born babe can see, at least it can distinguish light from dark, but it cannot reason; it has sensations but not percepts or concepts. Professor James has said that its experience must be that of a "big blooming, buzzing confusion." However all these traits or functions we have been discussing begin to develop early, not appearing full-fledged at one time as many people seem to think.

Our school work is divided more or less along the lines of child development into primary, intermediate and high school phases. At this time it is well for you to stop and check up on the traits of children at these ages. The instructor will assist you and perhaps arrange one or more observations. He may want you to specialize upon one of these three phases or stages or to study each less thoroughly. This is an excellent opportunity for you to try to find out something about other periods of child life than that with which the course you have chosen deals because at this time you may want to change your course if you find your talents, your interests and your probable future success lie in another direction.

References: Norsworthy and Whitley, ch. 15; Cameron, ch. 15; Bagley, *Educative Process*, ch. 12; for the high school period or adolescent period, consult Colvin, *Introduction to High School Teaching*, ch. 2 or Monroe, *Principles of Secondary Education*, ch. 7, or Averill, ch. 45. (Kirkpatrick, in his *Individual in the Making*, has the most detailed account of the different stages of child development, if one will read it with care and remember that what is reported is largely a matter of more or less isolated observations).

1. There seems to be much evidence that general bodily development and mental development go hand in hand, e. g. the changes that occur at puberty. Can you cite other illustrations of this fact? Is it likely that if a child is retarded physically he will in the majority of cases be retarded mentally? In any study of children at different ages or stages, which would be more desirable to know, the chronological age (that is, his age in years and months) or his mental age (representing his actual mental development)? How would the latter be found?
2. Bagley calls the period from 6-8 the transition period, that from 8-12 the formative period, and from 12-16 the adolescent period. Try to suggest better terms or to point out the traits prominent in these periods. Then follow up one or more periods with a careful study, centering a part or most of your thought in the following questions:
 - i. What are some of the better defined objectives (aims) of school work at this period?
 - ii. What are some of the more important instincts that are prominent at this period?
 - iii. What types of interests absorb the child's mind, vocational, scientific, social, play, etc.?
 - iv. What are some of the characteristics of his perceptions, imagination, reasoning, memory, attention, etc.?
 - v. What do you consider as some of the biggest problems of this period? Are you still most interested in it?

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